Clarke®

DIGITAL MULTIMETER

Model No: CDM20

PartNo: 4500007

0607

Clarke
INTERNATIONAL

WARNING

Before attempting to open the case, Always be sure that test leads have been disconnected from measurement circuits. Close case and tighten screws completely before using the meter to avoid electrical shock hazard.

DO NOT dispose of this product with general household waste. It must be disposed of according to all laws governing waste electrical and electronic products at a recognised disposal facility

WARNING

Before attempting to open the case, ALWAYS ensure that the test leads have been disconnected from their measurement circuits. Close the case and tighten the screws completely before using the meter to avoid the possibility of electric shock

Thank you for purchasing this CLARKE Digital Multimeter.
Please read this leaflet thoroughly and follow the instructions carefully, in doing so you can look forward to the multimeter giving you long and satisfactory service.

Guarantee

This CLARKE product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt as proof of purchase.
This guarantee is invalid if the product is found to have keen abused or tampered with in any way, or not used for the purpose for which it was intended.
Faulty goods should he returned to their place of purchase. No product can he returned to us without prior permission. This guarantee does not effect sour statutory rights.

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1. SAFETY PRECAUTIONS

This multimeter has been designed according to IEG-IOb concerning electronic measuring instruments with an overvoltage category (CAT II) and pollution 2.

Follow all safety and operating instructions to ensure that the meter is used safely and is kept in good operating condition.

1.1 PRELIMINARY

❇ When using this meter, the user must observe all normal safety rules concerning:

- Protection against the dangers of electronic current.
- Protection of the meter against misuse.

❇ Full compliance with safety standards can be guaranteed only if used with the test leads supplied. If necessary, they must be replaced with the same model or same electronic ratings. Measuring leads must be in good condition. Replacements are available from CLARKE International - see back page.

1.2 DURING USE

- ❊ Never exceed the protection limit values indicated in specifications for each range of measurement.
- ❊ When the meter is linked to measurement circuit, do not touch unused terminals.
- ❊ When the value scale to be measured is unknown before hand, set the range selector at the highest position.
- ❊ Before rotating the range selector to change functions, disconnect test leads from the circuit under test.
- ❊ Never perform resistance measurements on live circuits.
- ❊ Always be careful when working with voltage above 60V dc or 30V AC rms. Keep fingers behind the probe barriers while measuring.
- ❊ Before attempting to insert transistors for testing, always be sure that test leads have been disconnected from any measurement circuits.
- ❊ Components should not be connected to the hFE socket when making voltage measurements with test leads.

1.3 SYMBOLS

⚠ Important safety information, refer to the operating manual.
⚠ Dangerous voltage may be present.
⏚ Earth ground.
⧈ Double insulation (Protection class II).
⚠ A Fuse must be replaced with ratings specified in the manual.

1.4 MAINTENANCE

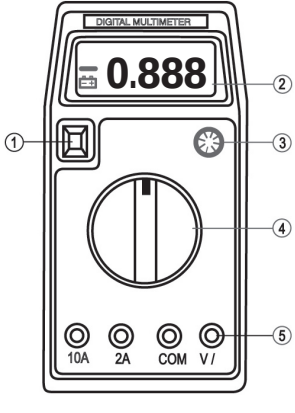
❇ Before opening the meter, always disconnect test leads from all sources of electric current.
❇ For continue protection against fire, replace fuse only with the specified voltage and current rating: F 2A1250V (quick acting).
❇ If any faults or abnormalities are observed, the meter cannot be used. It must be inspected and
❇ repaired by a qualified technician, or returned to CLARKE International for repair.
❇ Never use the meter unless the back cover is in place and fastened fully.
❇ Do not use abrasives or solvents on the meter, use a damp cloth and mild detergent only.

2. DESCRIPTION

This meter is a compact, rugged, battery operated, handheld 3 ½ digit multimeter, capable of performing the following functions:

- DC and AC voltage measurement
- DC and AC current measurement Resistance measurement
- Diode measurement
- Audible continuity test
- Transistor hEE measurement

The Dual-slope A/D Convert uses CMOS technology for auto-Zeroing, polarity selection and overrange indication. Full overload protection and low battery indication are provided



1. Power Switch
2. Display
3. Transistor Testing Socket
4. Rotary Switch
5. Input Jacks

2.1 POWER SWITCH

A push - push switch is used to turn the meter on or off.

2.2 DISPLAY

3 ½ digit, 7 segment, 18mm high LCD.

2.3 FUNCTION AND RANGE SELECTOR

There are different functions and 32 ranges provided. A rotary switch is used to select functions and ranges.

2.4 INPUT JACKS

1. "COM" jack - Plug in connector for black (negative) test lead
2. "V/Ω" jack - Plug in connector for red (positive) test lead for voltage and resistance.
3. "2A" jack - Plug in connector for red test lead for current (2A MAX).
4. "10A" jack - Plug in connector for red test lead for 10A measurement.

3. OPERATING INSTRUCTIONS

3.1 MEASURING VOLTAGE

1. Connect the black test lead to the COM jack and the red test lead to the V/Q jack.
2. Set the rotary switch at the desired V⎓ or V~ range position and connect test leads across the source or load under measurement.

   The polarity of the red lead connection will be indicates along with the voltage value when making DC voltage measurement.
3. When only the figure 1 is displayed, it indicates overrange situation and the higher range has to be selected

3.2 MEASURING CURRENT

1. Connect the black test lead to the COM jack and the red test lead to the A jack for a maximum of 2A current For a maximum of 20A, move the red lead to the 10A jack.
2. Set the rotary switch at desired A⎓ or A~ range position and connect test leads in series with the load under measurement

   The polarity of the red lead connection will be indicated along with the current value when making DC current measurement.
3. When only the figure "1" displayed, it indicates overrange situation and the higher range has to be selected

3.3 MEASURING RESISTANCE

1. Connect the black test lead to the COM jack and the red test lead to the V/Ω jack. (The polarity of red lead is "+")
2. Set the rotary switch at desired Ω position and connect test leads across the resistor under measurement.

NOTE

1. *If the resistance being measured exceeds the maximum value of the range selected or the input is not connected, an overrange indication "1" will be displayed.*
2. *When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been fully discharged .*
3. *For measuring resistances above 1MΩ the meter may take a few seconds to stabilise. This is normal for high resistance measurements.*

3.4 TESTING DIODE

1. Connect the black test lead to the COM jack and the red test lead to the V/Ω jack. (The polarity of red lead is "+".
2. Set the rotary switch at the ⊣◀ position and connect red lead to the anode, black lead to the cathode of the diode under testing. The meter will show the approx. forward voltage of the diode. If the lead connection is reversed, only figure "1" displayed.

3.5 TESTING TRANSISTOR

1. Set the rotary switch at hFE position.
2. Determine whether the transistor to be tested is NPN or PNP type and locate the Emitter, Base and Collector leads. Insert leads of the transistor into proper holes of the transistor testing socket.
3. The meter will show the approx. hFE value at test condition of base current 10μA and Vce 2.8V.

3.6 CONTINUITY TEST

1. Connect the black test lead to the COM jack and the red test lead to the V/Ω jack. (The polarity of the red lead is positive "+"
2. Set the rotary switch at♫ position and connect test leads across two points of the circuit under test. If continuity exists (i.e. resistance less than about 30Ω), built-in buzzer will sound.

4.SPECIFICATIONS

Accuracy is specified for a period one year after calibration and at 18° C to 28° C (64° F to 82° F) with relative humidity to 80 %.

4.1 GENERAL

Maximum Voltage between	CAT II 1000V.
Teminal and Earth Ground	CAT III 600V.
Fuse Protection	A: F 2A1250V; 10A: unfused.
Power Supply	9V battery, Neda 1604 or 6F22.
Display	LCD, 1999 counts, updates 2-3/sec.
Measuring Method	Dual-Slope integration ND converter.
Overrange indication	"1" figure only on the display.

Polarity indication	"-" displayed for negative polarity.
Operating Temperature	0ºC to40ºC (32ºF to l04ºF).
Storage Temperature	10ºC to 50ºC (14ºF to 122ºF).
Temp for guaranteed accuracy	23ºC ± 5ºC.
Low Battery Indication	appears on the display.
Size (W x L x H)	88W x 172L x 36H mm.
Weight	370g (including battery).

4.2 DC VOLTAGE

Range	Accuracy	Resolution
200mV	± 0.5% of rdg ±1 digits	100µV
2V		1mV
20V		10mV
200V		l00mV
1000V		IV

Input Impedance: 10MΩ on all ranges.

Overload Protection: 250 V rms AC for 200mV range, 1000 V peak or 700 V rms AC for other ranges

4.3 AC VOLTAGE

Range	Accuracy	Resolution
200mV	±1.2 % of rdg + 3 digits	100μV
2V	±0.8 % of rdg + 3 digits	1 mV
20V		10mV
200V		l00mV
700V	±1.2% of rdg + 3 digits	1V

Input Impedance: 10MΩ on all ranges.

Frequency Range: 40Hz to 1 kHz; Indication: Average (rms of sine wave).

Overload Protection: 250V rms AC for 200mV range and 1000V DC or 700V rms AC for other ranges.

4.4 DC CURRENT

Range	Accuracy	Resolution
20μA	± 2.0 % of rdg+ 5 digits	10nA
200μA	±0.8% of rdg + 1 digits	0.1μA
2mA		1μA
20mA		10μA
200mA	± 1.2 % of rdg ± 1 digits	100μA
2A		1mA
10A	±2.0% of rdg + 5 digits	l0mA

Max Input Current: 2A:2A. 10A:10A continuous, 20A 15 sec.MAX.

Overload Protection: 2A/250V fuse (10A range unfused); Measuring Voltage Drop: 200mV

4.5 AC CURRENT

Range	Accuracy	Resolution
20µA	±3.0% of rdg + 7digits	l0nA
200µA	±1.0% of rdg + 3digits	0 .1µA
2mA		1µA
20mA		10µA
200mA	± 1.8% of rdg 3 digits	100µA
2A		1mA
10A	± 3.0% of rdg + 7 digits	l0mA

Max Input Current: 2A2A. 10A10A continuous, .20A 15 sec MAX

Overload Protection: 2A/250V fuse (10A range unfused); Frequency Range 40Hz to 1kHz

Indication: Average (rms of sine wave) Measuring Voltage Drop 200mV

4.6 RESISTANCE

Range	Accuracy	Resolution
200Ω	±0.5% of rdg + 3 digits	0.1Ω
2KΩ	±0.5% of rdg + 1 digit	1Ω
20KΩ		10Ω
200kΩ		100Ω
2MΩ		1 KΩ
20MΩ	±1.0% of rdg + 2digits	10KΩ

Overload Protection: 250V DC/AC rms on all ranges.

Open Circuit Voltage: Less than 700mV.

4.7 Diode and Audible Continuity Test

Range	Description	Test Condition
	Display read approximate forward voltage of diode	Forward DC current approximately 1mA. Reversed DC voltage approximately 2.8V.
	Built-in buzzer sounds ifresistance is less than approximately 30Ω	Open Circuit Voltage approximately 2.8V.

Overload Protection: Sounds alarm (250V AC/DC rms)

4.8 Fransistor hEE Test

Range	Description	Test Condition
hFE	Display read approximate hFE value (0-1000) transistor under test (ALL TYPE)	Base Current approx l0μA VCE approximately 2.8V.

5. ACCESSORIES

Test leads	Electric Rating 1500V, 10A MASTECH HYTL — 095
Battery	9V NEDA 1604 or 6F22
Operating Manual	HYS004343

6. BATTERY & FUSE REPLACEMENT

If the sign appears on the LCD display, it indicates that battery should be replaced. Remove screws on the back cover and open the case. Replace the exhausted battery with a new one.

The fuse should rarely need replacement and will blow almost always as a result of operator error. Open the case and replace the blown fuse with the ratings specified: F 2A/250V (quick acting).

SPARE PARTS: A set of replacement leads is available from your dealer.

Quote **Part number CK0020**

For Spare Parts and Serviceing, please contact your nearest dealer, or CLARKE International as follows:

TEL: 020 8988 7400

eMail: parts@clarkeinternational.com or service@clarkeinternational.com